REMARKS

[01] The present amendment adds pages 6-11 to the application. The addition does not constitute new matter as it merely makes explict material that was already incorporated by reference. More specifically, by virtue of the co-filed preliminary amendment, the present application incorporates by reference U.S. Patent Application 09/514,975, (now issued as U.S. Patent 6,309,875) which is essentially the same as the present application except that pages 6-11 were not inadvertently omitted. The addition of pages 6-11 overcomes the objections presented in Items 1, 2a, and 2b of the most-recent Office Action.

[02] The present amendment makes editorial corrections to pages 1, 4, and 14. More specifically, an errant global replace of "cap" to "cover" inadvertently affected the words "capable", "capillary", and "captured". The present amendment restores these words to their proper form.

[03] Original Claims 8-15 have been amended to address the objection to Claim 11 of Item 3 and the indefiniteness rejections of Item 5. In addition, Claim 8 has been amended to overcome the rejections for anticipation and obviousness. Specifically, none of the cited references explicitly disclose or inherently involve centrifugal forces in excess of 1G.

[04] New Claims 16-25 have been added. New independent Claim 16 roughly corresponds to original Claim 9, while new independent Claim 20 roughly corresponds to original Claim 12. Due to this correspondence, the original rejections may have some applicability to the new claims. As explained below, rejections based on Trulson were in error as applied to the original claims and should not be reasserted against the new claims.

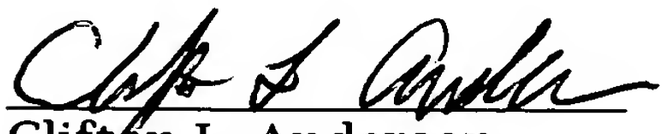
[05] The original claims were rejected as being either anticipated by U.S. Patent No. 6,258,593 to Trulson et al., "Trulson" herein, or as obvious over a combination of references including Trulson. These rejections were in error and would be in error if applied to the new claims as these rejections are based on a mis-interpretation of Trulson.

[06] The Office Action erroneously equates Trulson's use of the term "circulate" with "rotating" as used in the claims. The claims require that a reaction cell containing sample fluid be rotated. "Circulate" as used in Trulson simply denotes that a fluid is made to flow in a circuitous path. This usage is the same as in "blood can circulate through the human body". In that case, the blood flows in a circuitous manner independently of any rotation by the body itself. In Trulson, the fact that fluid urged by pumping to flow in a circuitous manner through a cavity does not imply that the cavity itself is being rotated. To the extent that any rejections based on Trulson relied on this misinterpretation of "circulate" those rejections should be withdrawn and should not be applied to the new claims.

CONCLUSION

All objections and rejections have been overcome by amendment. Accordingly, it is respectfully submitted that the present application is in condition for allowance, which allowance is respectfully requested.

Respectfully submitted



Clifton L. Anderson
Reg. No. 30,989
(408) 245-0820

Replacement paragraph for Page 1, lines 18-26.

Hybridization reactions between surface-bound molecular probes and target molecules in a sample liquid may be used to detect the presence of particular biomaterials including biopolymers and the like. The surface-bound probes may be oligonucleotides, peptides, polypeptides, proteins, antibodies or other molecules capable of reacting with target molecules in solution. Such reactions form the basis for many of the methods and devices used in the new field of genomics to probe nucleic acid sequences for novel genes, gene fragments, gene variants and mutations.

Replacement paragraph for Page 4, lines 3-15.

In U.S. Patent No. 4,849,340 to Oberhardt, an alternative means is disclosed for mixing components in a fluid during an assay performed in an enclosed chamber. Oberhardt discloses an apparatus comprising a base, an overlay and a cover which when combined define a sample well, a channel, and a reaction space. Fluids introduced into the sample well flow by capillary action to the reaction space. Mixing of fluids within the reaction space is effected using mechanical or electromechanical means to create forced convection currents. Again, large sample volumes are required (100 to 200 μl) because of the need to maintain a gap between the base and the cover during mixing. Additionally, the method relies on capillary action to promote fluid flow, and mixing may thus be slow and incomplete, particularly when viscous reagents are used.

Replacement paragraph for Page 14, lines 4-23.

As noted above, the cover preferably has a lip along the perimeter of the cover bordering a recessed portion that comprises the major portion of the area of the inner face of the cover. Applying pressure to the outer face of the cover directly above the perimeter lip is required to form the tight seal between the cover and the substrate. Any means that presses the lip of the cover securely to the substrate is suitable. Such pressure may be applied evenly by, for example, clamps, a press, or by capturing the substrate and cover within a two-part rigid frame and compressing the two together to supply an even pressure to the cover and substrate. If desired, the peripheral lip of the cover may be modified to provide for an improved seal; for example, one or more continuous ridges can be incorporated into the lip so that the pressure supplied to the cover is higher at those locations and preferentially causes them to compress. In any of these embodiments, the reaction cell may be re-used, as the peripheral seal is temporary and the fastening means may be removed when desired. Thus, the reaction cell may be readily disassembled after use, cleaned, and re-assembled (with alternate components, such as a different substrate, if desired) so that some or all of the components of the reaction cell may be re-used.

CLAIMS

8. *(currently amended)* ~~An array hybridization~~ A method comprising the steps of:

introducing sample liquid into a reaction cell having a hybridization probe array so that some interior volume is partially occupied by sample liquid and partially occupied by gas;

centrifuging said sample liquid by rotating said reaction cell ~~having a probe array~~ so that centrifugal ~~forces~~ force in excess of 1G urges said sample liquid against said array; and

agitating said sample liquid in said reaction cell during said centrifuging so that said sample liquid moves relative to said array.

9. *(currently amended)* ~~An array hybridization~~ A method as recited in Claim 8 wherein said agitation involves rotating said ~~sample~~ reaction cell about an agitation axis that is more orthogonal to than along said centrifugal force.

10. *(currently amended)* ~~An array hybridization~~ A method as recited in Claim 9 wherein said agitating involves periodically changing the direction of rotation about said agitation axis so as to define an agitation cycle rate.

11. *(currently amended)* ~~An array hybridization~~ A method as recited in Claim ~~11~~ 10 wherein said centrifuging involves rotating said reaction cell at a centrifuge rate greater than said agitation rate.

12. *(currently amended)* ~~An array hybridization~~ A method as recited in Claim 10 wherein said agitation involves rotating said ~~sample~~ reaction cell about an agitation axis that extends more parallel to than orthogonal to said centrifuge axis .

13. *(currently amended)* ~~An array hybridization~~ A method as recited in Claim 12 wherein said array extends more orthogonal to said centrifugal force than along it so that said centrifugal forces urges said sample liquid against said array.

14. *(currently amended)* ~~An array hybridization~~ A method as recited in Claim 13 further comprising a step of removing sample liquid from said reaction cell, said removing step involving rotating said reaction cell by rotating it about said agitation axis so that said centrifugal force urges said fluid in said reaction cell away from said array.

15. *(currently amended)* ~~An array hybridization~~ A method as recited in Claim 8 wherein said sample liquid occupies at most half of said interior volume~~said reaction cell is filled at most half way with sample liquid~~.

16. *(new)* A method comprising:

introducing sample liquid into a reaction cell having a hybridization probe array so that some interior volume is partially occupied by sample liquid and partially occupied by gas;

centrifuging said sample liquid by rotating said reaction cell so that centrifugal force urges said sample liquid against said array; and

rotating said reaction cell about an agitation axis that is more orthogonal to than along said centrifugal force so that said sample liquid moves relative to said array.

17. *(new)* A method as recited in Claim 16 wherein said agitating involves periodically changing the direction of rotation about said agitation axis so as to define an agitation cycle rate.

18. *(new)* A method as recited in Claim 17 wherein said centrifuging involves rotating said reaction cell at a centrifuge rate greater than said agitation rate.

19. *(new)* A method as recited in Claim 18 wherein said sample liquid occupies at most half of said interior volume.

20. *(new)* A method comprising:

introducing sample liquid into a reaction cell having a hybridization probe array so that some interior volume is partially occupied by sample liquid and partially occupied by gas;

centrifuging said sample liquid by rotating said reaction cell so that centrifugal force urges said sample liquid against said array; and

rotating said reaction cell about an agitation axis that is more parallel than orthogonal to said centrifugal force so that said sample liquid moves relative to said array.

21. *(new)* A method as recited in Claim 20 wherein said agitating involves periodically changing the direction of rotation about said agitation axis so as to define an agitation cycle rate.

22. *(new)* A method as recited in Claim 21 wherein said centrifuging involves rotating said reaction cell at a centrifuge rate greater than said agitation rate.

23. *(new)* A method as recited in Claim 20 wherein said array extends more orthogonal to said centrifugal force than along it so that said centrifugal force urges said sample liquid against said array.

24. *(new)* A method as recited in Claim 23 further comprising removing sample liquid from said reaction cell, said removing involving rotating said reaction cell by rotating it about said agitation axis so that said centrifugal force urges said fluid in said reaction cell away from said array.

25. *(new)* A method as recited in Claim 20 wherein said sample liquid occupies at most half of said interior volume.